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Regional inequalities in self-rated health in Russia: What is the role of social and economic capital?

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Abstract

Using the data from the European Social Survey (round 6, 2012), this article studies regional inequalities in self-rated health in Russia and examines the role that socio-demographic factors and economic and social capital play in these differences. Also, the regional variation in the determinants of self-rated health is analysed. The article argues that there are considerable and statistically significant unadjusted differences in self-rated health across Russian Federal Districts. We elaborated these differences by regression adjustments, with the result that some of the differences were explained by our predictors and some were amplified. The odds for good self-rated health were lower in the Volga than in Central Russia due to age and socio-economic composition. In contrast, the regression adjustments amplified the differences of the Northwest and the South in comparison to the Central District. The odds for good self-rated health were considerably lower in the Far Eastern part of the country than in the Central District, independently of the adjustments. While social and economic capital predicted good self-rated health at the individual level, they did not explain regional differences. Interaction analyses revealed regional variation in some of the determinants of self-rated health. Most notably, the effects of age, trade union membership and volunteering depended on the regional context. This article argues that the healthcare reforms that transfer funding responsibilities to regional administration may be dangerous for the already less affluent and less healthy rural regions. Thus, regional governance has a growing importance in preventing increases in health inequalities.

1 Introduction

Russian public health deteriorated dramatically after the collapse of the Soviet Union. One of the clearest indicators of the Russian public health crisis was declining life expectancy, especially of men. During the late Soviet period, public health had started to improve, but along with the collapse of the Soviet state, life expectancy decreased by over five years between 1990 and 1994 (Wallberg et al. 1998; Rose 2009, 85). The high mortality of Russians has been associated with cardiovascular diseases resulting from unhealthy lifestyles, such as alcohol abuse, smoking, lack of exercise and high fat diets, as well as from inefficient health policies (Cockerham 2000, 1313; Men et al. 2003; Carlson & Hoffmann 2011). Cockerham (2000) associates the high mortality of Russians partly with the change in health governance: the state's responsibility and control over public health drastically decreased, while individual-level health practices were not well developed.

After a long decline, life expectancy in Russia has increased since 2004 (Carlson & Hoffman 2011; Shkolnikov et al. 2013; Grigoriev et al. 2014) and it has recovered to around the levels of the late Soviet Union: 65.1 for men and 76.3 for women (OECD 2015). Grigoriev et al. (2014, 125) argue that the recent decline in Russian mortality results from behavioural changes, such as improvements in diet and decreases in alcohol consumption, as well as from better implementation of health policies and improvements in economic conditions.

Russia, the world's largest country, stretching from Europe to Asia, is a federative state in which regions have autonomous jurisdiction over their internal political, economic and social affairs and over regional budgets. According to Fedorov (2002), regional inequalities and polarisation are serious policy concerns in post-Soviet Russia. Russia's transition to a market economy has led to growing regional inequalities: the areas with material and human assets have grown, while poor areas have become even more deprived (Fedorov 2002; Lane 2013; Remington 2011a; 2011b). Consequently, the fall in life expectancy did not affect all parts of the country equally (Walberg et al. 1998). More recently, Grigoriev et al. (2014) have

argued that the ongoing cuts in healthcare expenditure especially affect the already less affluent regions, and so contribute to growing regional inequalities.

Thus, even if life expectancy has returned to the level of the late Soviet Union, economic and social inequalities as well as regional differences in the standard of living have grown. In this article, we aim to analyse contemporary Russian health inequalities from the point of view of regional differences. We approach health empirically with the concept of self-rated health, which is generally considered a relatively valid and reliable measure of general health status (Lundberg & Manderbacka 1996; Burström & Fredlund 2001; Heistaro et al. 2001; Jylhä 2009). Self-rated health is on average worse in the former communist countries than in Western Europe (Carlson 1998) and worse in Russia than in the post-communist new EU member states (Rose 2009, 90).

There are several studies on self-rated health in Russia from the early transition period (Bobak 1998; Bobak 2000; Carlson 2001; Kennedy et al. 1998; Rose 2000). Most of the more recent studies approach Russian public health from the point of view of socio-demographic determinants, informal social structures and perceived control over life (Bobak et al. 1998; 2000; Carlson 2004; Nicholson et al. 2005; Perlman & Bobak 2008; Rojas & Carlson 2006; Vågerö & Kislitsyna 2005). Economic satisfaction has been shown to be a powerful predictor of self-rated health in both in eastern and western parts of Europe (Carlson 1998; 2004) as well as in Russia (Rojas & Carlson 2006). Furthermore, research results indicate that social capital, in the form of trust, social networks and participation in civic activities, plays a role in self-rated health (Carlson 2004; Carlson 2015; Ferlander & Mäkinen 2009; Rose 2000; Rojas & Carlson 2006) and in the Russian 'mortality crisis' in general (Kennedy et al. 1998).

Most of the earlier studies concentrate on cities where survey data is available, such as Moscow (Ferlander & Mäkinen 2009) or Taganrog (Carlson 2001; Rojas & Carlson 2006; Vågerö & Kislitsyna 2005) or on international comparisons (Carlson 1998; Carlson 2004; Heistaro et al. 2001; Vuorisalmi et al. 2008; Carlson 2015), while contextual analyses in Russia are few. Regional health differences in the early transition period have been addressed by Walberg et al. (1998), Kennedy et al. (1998) and Carlson (2005). Walberg et al.

(1998) used data from 52 regions of European Russia to study how socio-economic change was associated with the decline in life expectancy in Russia between 1990 and 1994. They found that the fall in life expectancy varied across different regions: the largest falls were found in predominantly urban regions, which had high rates of labour turnover, a higher on average but unequal distribution of household income and large increases in recorded crime. Thus, the fall in life expectancy cannot be due to economic impoverishment alone; instead, the impact of social and economic transition, together with a lack of social cohesion, contributed to deteriorating public health. In line with this interpretation, Kennedy et al. (1998) found in their ecological analysis of 40 Russian regions that the regional variations in mortality and life expectancy were partly associated with social capital. Using electoral district data from 1998 from randomly selected districts, Carlson (2005) investigated income distribution in Russian regions and its impact on self-rated health and found that regional income inequality predicts self-rated health, but only for men.

The existing literature does not sufficiently elucidate the contemporary Russian regional reality, since it does not cover the entire country and since a number of important societal changes have taken place in the 2000s, rendering older evidence less pertinent. The interregional income inequalities increased during the early 2000s (Remington 2011a; 2011b) and regional governance has been reorganised by the Presidential Decree of 2000, which created the new Federal Districts and centralised political control (Petrov 2002). In the 2000s, the state strengthened its control over civic and political activities, which weakened civil society. The global economic crisis has had an impact on Russia's economy and changed the conditions for health and well-being. Hence, contemporary regional inequalities in public health remain unexplored. Our study contributes to this subject with the help of an up-to-date dataset and a theoretically advanced approach to social and economic capital.

By using a high-quality survey dataset (ESS 2012) on the entire country from the year 2012, we studied the regional variation in self-rated health across the Federal Districts in this new economic and political order. Consistent with earlier research (Kennedy et al. 1998; Kawachi et al. 1999; Carlson 2005; Ahnquist et al.

2012; Carlson 2015), our study examines the role of economic and social capital in contextual health inequalities. Our analytical strategy focuses on concrete regions instead of general trends. We also discuss contextual explanations for health inequalities with the help of the Russian Federal State Statistics Service's regional statistical data (Rosstat 2014). Furthermore, we explore the possibility that the determinants of health may differ from one region to another.

Following this, our research questions are:

1) Are there regional differences in self-rated health in contemporary Russia?
2) If yes, are these differences explained by the socio-demographic composition of the regions?
3) Do the determinants of self-rated health differ in different regions? If yes, how?

The empirical section of our study proceeds as follows. First, we study the unadjusted regional differences in self-rated health. Then we control for the socio-demographic composition of the regions to see whether it explains these unadjusted differences. After this, we investigate by interaction analyses whether there is regional variation in the determinants of self-rated health. Finally, we use the Russian register data to theoretically understand the adjusted contextual differences.

In section 2, we present the theoretical and empirical background of social and economic capital as predictors of self-rated health, a conceptual approach that we use to design our study. Data, indicators and methods are introduced in the third section, followed by the empirical results (section 4). The last part of the text discusses the findings' theoretical and practical implications and gives suggestions for future research.

2 Social and economic capital in the contextual analysis of health

The key notion in the contextual analysis of health is that of *contextual effect*, which refers to the impact that the context (e.g. residential environment) may have on health. The factors that may bring about contextual health effects include spatial patterns in physical and biological risk factors, relevant services,

socio-cultural factors and labour markets (Macintyre et al. 1993; Curtis & Jones 1998; Kawachi et al. 1999). Our approach draws on the tradition of studies that examine contextual health effects from a socio-cultural point of view, most often conceptualised in terms of social capital. Possible pathways for the contextual social capital to impact health include the diffusion of health information, the adoption of norms relevant to health, social control over behaviour, affective support and collective capacity to defend local amenities (Kawachi et al. 1999).

The excessive control over the social life of its citizens and the arbitrary rule of law under the Communist system encouraged the creation of protective informal networks, which continued to greatly matter in post-Soviet Russia (Rose 2009). Kennedy et al. (1998) argued that the lack of social capital explained regional differences in mortality and life expectancy in Russia in the early 1990s, in a context where social capital, in the form of social and political connections, was used to gain access to new opportunities opened up by economic reforms. As Kennedy et al. (1998, 2039) explain: 'those who have access to social capital get ahead; those who do not, get sick and die'. Social relations and informal economics, the so-called *blat* system, were used to acquire material goods in the Soviet Union. After the collapse of the Soviet Union, many people continued to rely on informal sources of support, such as family and friends, instead of institutional sources (Kennedy et al. 1998; Rose 2009). However, the *blat* relations were transformed too; they were still crucial for survival, but they were used to acquire services and immaterial goods, such as education or health services, instead of material goods (Ledeneva 2009).

Studies investigating the importance of both social and economic capital for health are few. Carlson (2004) found that both economic and social factors explained health differences between the countries of the former Soviet Union and Western Europe, but he argues that economic factors are more important in predicting poor health. Rose (2000), on the other hand, found that both economic and social capital were equally important and independently explain physical and mental health. In Carlson's recent study (2015) on the association of trust with self-rated health in Poland, Estonia and Russia, individual health was related to both a better economy and stronger trust, while economic factors alone explained inter-country

differences. Furthermore, Carlson (2015) found that lack of both interpersonal and institutional trust was associated with poor health in the three post-communist countries studied.

Anhquist et al. (2012) note that even if recent studies have found an independent association between health and both social and economic capital, it is important to note that there might be interactive effects between social capital and economic hardship. Thus, social capital might impact on economic resources and vice versa, and a combination of insufficient social and economic capital can create a double burden on health (Ahnquist et al. 2012, 931). The authors differentiate between the structural and cognitive dimensions of social capital. They define social participation as the structural dimension and the *social* side of social capital. Social trust, on the other hand, is the cognitive dimension of social capital. Both dimensions are further divided into horizontal (interpersonal) and vertical (political/institutional) aspects of social capital (Ahnquist et al. 2012, 932). In this article, we follow Ahnquist et al. (2012, 932) and use social participation to represent the structural dimension of social capital and two measures of trust, interpersonal (horizontal) and institutional/political (vertical) trust, to measure cognitive aspects of social capital.

3 Data, indicators and methods

3.1 Data

Our main data come from the European Social Survey, round 6 (2012, ed. 02), which has the advantage of post-stratification weights that help to address the impact of non-response (response rate 67.01%, (ESS Data Archive 2014)). Hence, our study provides more reliable estimates than the previous studies on self-rated health in Russia that used the versions of ESS data without these weights. We also collected extensive regional data from Russian register sources (Rosstat 2014), with which we deepen our understanding of the regional differences in self-rated health.

3.2 Indicators

Our binary outcome variable is based on the question 'How is your health in general? Would you say it is very good, good, fair (in the Russian questionnaire: average, *srednee*), bad or very bad?' In a recent study on self-rated health and trust in eastern Europe, Carlson (2015) categorised the scale so that 'very good' and 'good' constituted a category of their own, describing the state of good health. Ahnquist et al. (2012) used a similar categorisation. According to Carlson (2015), this classification aptly reflects both popular conceptions and the idea of health as a positive state, and not only as the absence of illness. Considering the argumentation sound, we follow this approach. As a further advantage, this choice grants more statistical power to the analyses due to the shape of the univariate distribution, where only around 15 percent of the respondents report 'bad' or 'very bad' self-rated health as compared to around 35 percent reporting 'good' or 'very good'. For logical coherence, we designed the analyses so that our models predict good health.

Russia consists of 85 Federal subjects, grouped into the eight Federal Districts (*Federalny okrug*) indicated in the ESS data. The low number of regions did not allow a statistically meaningful hierarchical analysis using regional level variables (e.g. GDP, crime rate) for predicting the outcome. Hence, the combination of a fixed effects analysis and a separate case-oriented regional examination was a convenient choice for the analytical design. We chose Central Russia as the reference category due to its political, cultural and economic centrality. Other regions are included in the analysis as fixed effects.

The other predictors were chosen and refined as the result of an iterative process, in which the insights from the existing literature were combined with empirical examination, with the aim of reaching a reasonable balance between complexity and parsimony.

Our demographic predictors included age, gender, marital status and residential environment. Only the category 'divorce' was retained from the variable *marital status* due to its predictive power in the final model. The variable *residential environment* was simplified: the categories 'big city' and 'suburbs or

outskirts of a big city' were combined (reference category); the category 'town or small city' was kept as such; 'country village' and 'farm or home in the countryside' were combined.

An extensive set of socio-economic predictors was also included in the analyses. One indicator captures *unemployment*. A tripartite classification of *education level* was constructed on the basis of the International Standard Classification of Education (ISCED): tertiary (ISCED levels 5–6), secondary (3–4) and basic (0–2; reference category) (e.g., Moustgaard 2015). The objective income indicator was excluded from the analysis due to problematic item non-response (n=534). Hence, we relied on the respondent's perception of the *current economic situation of the household*, ranging from 'very difficult' to 'living comfortably' (four-point scale; missing values (n=64) were imputed by the median). Moreover, in Russia, the informal economy plays a large role in the household economy, which supports the use of a subjective economic indicator (see Ledeneva 2009). In line with Rose (2009, 88–91) and to better cover the socio-economic situation of the respondent, the respondent's subjective view on the *place one occupies in society* was also included (from bottom/0 to top/10; missing values (n=88) were mean-imputed).

Finally, *social capital* was indicated in an extensive manner (cf. Rojas and Carlson 2006; Ahnquist et al. 2012), which is necessary due to the vast theoretical scope of the concept. As presented earlier, we followed the categorisation presented by Ahnquist et al. (2012). Table 1 presents the categories and indicators, and further technical details can be found in Appendix 2.

[Table 1 about here]

3.3 Methods

Multivariate logistic regression analyses were performed using SPSS and the post-stratification weights were used by the Complex Samples module (e.g. Siller & Tompkins 2006). The 5% level is used in the text as the level of statistical significance. In the case of categorical predictors, we included the missing observations as their own categories when item non-response threatened the power of the regression analysis; their estimates are omitted from the regression table as they are not of substantial interest. The

interaction analyses were performed on top of the full main effects model by testing separately the two-way interactions of the region variable with age and with the indicators of social and economic capital.

3.4 The Federal Districts

The Federal Districts were created in 2000 by Federal Decree of the President of Russia. The North Caucasian Federal District was split off from the Southern Federal District in 2010. According to Petrov (2002, 86), the Federal Districts were created for specific political purposes, mainly to strengthen and centralise presidential control, and not for societal needs. Accordingly, the socio-economic structure and size of the districts varies considerably. The Volga District produces the most in the fields of industrial production and agriculture, while the Urals District is strong in industrial production and the Southern District in agricultural production. Other districts are more balanced in their economic structure (Petrov 2002). The Far Eastern District is largest in size, but it is the least populated of the districts, while the Central District's population includes 25% of all Russians (see Table 2). The Central, Northwestern and the Urals Districts are the most urban of the regions.

[Table 2 about here]

The Urals, Far Eastern and Central Districts have the highest per capita Gross Regional Product GRP. In line with this, the Central and the Urals Districts have the highest average per capita purchasing power. The North Caucasian, Siberian and Volga Districts have clearly lower than average GRPs and purchasing power.

When we look at budget spending in different regions, the Far Eastern, Central and the Urals Districts have the biggest per capita general budget, while the North Caucasian, Southern and the Volga Districts have the lowest budgets. This is also reflected in the districts' budget spending on education, public health and social politics.

With regard to health indicators, the Volga, Central and Northwestern Districts have the highest mortality rates, while the Urals and North Caucasian Districts report the lowest mortality rates. This resonates with

the earlier findings of Walberg et al. (1998), who found that the urban areas were the most affected by the negative health consequences of the transition period.

Finally, we used the number of reported crimes as an indicator of social cohesion in the regions. The Siberian, Far Eastern and Urals Districts have the most reported crime, while the Southern and North Caucasian Districts have the fewest reported crimes. However, it should be noted that the North Caucasian region has been severely affected by the Chechen wars as well as by interethnic conflicts, terrorism and counter-insurgency politics; therefore the statistics for the region should be interpreted with caution. In addition, Walberg et al. (1998) argue that North Caucasian region exhibits a different pattern of health compared to other Russian regions, one that is more similar to that of Transcaucasian countries (Armenia, Georgia and Azerbaijan). They also believe that these regions tend to under-register deaths of elderly people (Walberg et al. 1998, 313).

4 Results

4.1 Are there regional differences in self-rated health in contemporary Russia?

Let us report the empirical findings of the study by addressing each research question in turn. First, we were interested in whether or not there are regional differences in self-rated health in contemporary Russia (RQ 1). Bivariate analysis (column I in Table 3) shows that, compared to the Central District, the unadjusted odds for good self-rated health are lower in the Volga (OR=0.70) and the Far East (OR=0.41), whereas the odds are higher in the South (OR=1.39). Other unadjusted differences are not significant, but the results are worth noting for the North Caucasus, where the odds are relatively high (OR=1.37), even though non-significant. In sum, there are statistically significant unadjusted regional differences in self-rated health in contemporary Russia.

[Table 3 about here]

4.2 Are the regional differences in self-rated health explained by the socio-demographic composition of the Districts?

In the next phase of analysis, we examined these unadjusted differences by design-based multivariate logistic regression. The aim was to find out to what extent regional inequalities would be explained by the differences in the socio-demographic composition of the regions (RQ 2). It is useful to know more specifically how different predictors function in this sense. For this purpose, we divided the predictors into the following groups: age (in models II to VI); age with other demographic variables (model III); age with socio-economic variables, including subjectively evaluated economic resources (model IV); and age with social capital (model V). Finally, the full model (model VI) includes all predictors. This modelling strategy helped us to answer the second research question.

The findings were different for the different regions. In the case of the Volga, the unadjusted difference to the Central District was explained by taking into account the composition of age (model II) and socio-economic variables (model IV). An opposite pattern applied to the cases of the South and Northwest, where controlling for the composition did not explain, but rather accentuated the unadjusted differences. The Northwest did not differ from the Central District in the bivariate analysis, but controlling for age (model II) rendered the difference significant, which was further strengthened by the introduction of socio-economic status in model IV. A slightly different pattern applied to the South, where even the unadjusted difference was significant. The unadjusted results tended to underestimate the regional differences in these cases. The odds for good self-rated health are higher in the Northwest and South of the country compared to in the Central District and this is not explained by the variables in our models.

The odds for good self-rated health were considerable lower in the Far East of the country than in the Central District, and the odds remained more or less the same across models. In other words, controlling for the mentioned variables had virtually no impact on the unadjusted difference.

In the remaining regions, both the unadjusted and the final estimates were non-significant. In the Urals and Siberia, the direction of the difference changed, as the weak and non-significant ORs less than one became somewhat more pronounced, but still non-significant ORs greater than one. Finally, controlling for age (model II) attenuated the originally non-significant OR's of the North Caucasus to around one.

We checked the sensitivity of our nested logistic regression findings using linear probability models (LPM). In general, our results from the nested logistic models were in line with the corresponding LPM results. Only the estimate for the Far East behaved slightly differently in the LPMs, where the unadjusted estimate was somewhat attenuated in the regression elaboration, but remained significant and retained its original sign. We also estimated the full main effects model using the dataset with multiple imputations instead of our simple imputations, with very similar results.

In sum, the analysis showed that the regional differences in self-rated health in contemporary Russia are not fully explained by the socio-demographic composition of the districts.

4.3 How do the determinants of self-rated health differ across regions?

Next, we studied by interaction analysis the possibility that the determinants of self-rated health might vary across regions (RQ III). In practice, we concentrated on age and social and economic capital, and examined their interaction with the region variable. This focus stems from the crucial role that age plays in terms of self-rated health and from our more general emphasis on social and economic capital. We used the full model as the basis, with the Central District as the reference for the interaction analyses. The analyses were performed for each variable separately, and here we report only the significant results using the significance level of 0.05.

First, it is useful to report the main effects of the individual-level variables in order to better understand the results of the interaction analyses. To a large extent, the full model supports earlier findings on self-rated health: higher age and female gender (cf. Carlson 1998) are associated with lower self-rated health, whereas subjective perception of social status and economic and social capital are associated with higher self-rated health (cf. Rojas & Carlson 2006; Ahnquist et al. 2012). More specifically, interpersonal trust, involvement in the exchange of help and participation in voluntary organisations predict higher odds for good self-rated health (see Table 1, Table 3 and Appendix 2). This suggests that the *blat*-system of informal networks and mutual help is still important for health and well-being in contemporary Russia (see Ledeneva 2009). In contrast, trade union membership is associated with lower self-rated health.

Let us continue with the regional interaction analysis. The results for the reference region (the Central District) differed substantially from the full model only in the case of participation in volunteer organisations, which was not associated with good self-rated health. Next we report how the results from other regions differ from those for the Central District (Table 4). In the Northwest and Siberia, age and trade union membership have more pronounced negative associations with self-rated health. In addition, voting is associated with lower self-rated health in Siberia, but not elsewhere. The North Caucasus differs from the Central District in many respects: the association of economic capital with self-rated health is considerably attenuated, whereas loneliness and volunteering are more strongly associated with health. However, the number of respondents in the North Caucasus District was relatively low (n=146). Furthermore, the results might reflect the region's problematic political situation and different health pattern (see section 3.4).

[Table 4 about here]

5 Discussion

In this study, we set out to examine the variation of self-rated health across the regions of Russia. First, we found that there are considerable and statistically significant unadjusted differences in the odds for good self-rated health between regions. Next, we elaborated these differences by multivariate regression, with the result that some of the differences were explained by our predictors, while some were amplified. We found that the odds for good self-rated health were lower in the Volga than in the Central District due to age and socio-economic composition. In contrast, compared to the Central District, the odds for good self-rated health were higher in the Northwest and South of the country, which was further strengthened after adjustments. The odds for good self-rated health were considerable lower in the Far East than in the Central District, and this is something that our predictors also do not account for.

Consistent with earlier literature on the topic, we found that social and economic capital predict good self-rated health at the individual level. However, regional inequalities in self-rated health were not explained by accounting for the capital composition, which merits further attention. Compared to people living in the Central District, the population of the Far Eastern District has a considerably lower odds ratio for good self-rated health, while the population of the Northwest and South have clearly higher odds. The findings of Kawachi et al. (1999), Kennedy et al. (1999) and Walberg et al. (1998) provide insights for the interpretation of these results. Walberg et al. (1998) and Kennedy et al. (1998) interpret crime as a proxy measure of strained social relations and low social cohesion. Compared to the Central District, crime rates are higher in the Far Eastern District and lower in the Southern District. Also, in the Northwestern District, crime rate is lower than the Russian average (see Table 2). These findings may indicate regional differences in social cohesion, which in these cases might have public health implications. This interpretation is naturally only suggestive and needs further research for confirmation.

The contextual units of our analysis (Federal Districts) are geographically rather large and basically administrative. Units of this size are necessarily internally heterogeneous. Nevertheless, the findings on the regional health differences are strong and, logically, they would be even stronger if we had more fine-grained contextual units at our disposal. The strength of the findings calls for further research and policy measures. When large survey datasets are collected from Russia in the future, the use of smaller and substantially more meaningful units should be considered (e.g. *subyekty*), as this would enable more fine-grained analyses of the contextual variation of health and other outcomes. A higher number of units with contextual information would enable the use of hierarchical models instead of a fixed effects model, with the benefit of gaining a more detailed understanding of the contextual determinants of health.

One interesting result that rises from our analysis is the negative association of trade union membership with self-rated health. Participation in a voluntary organisation as a form of social capital is often seen as contributing to better health. However, in Russia, the trade unions are continuers of their Soviet predecessors, which were not so much protectors of workers' rights but rather represented state control in

the working place in the form of compulsory membership, which has left a legacy of distrust (Ashwin 2004, Rose 2009, 62). Even today, although membership is not obligatory, trade union membership can be seen as habitual or even forced in some working places (Kubicek 2002). Additionally, the Russian trade unions represent traditional heavy industries, which often include heavy and risky working conditions, while the lighter service sector employees are non-unionised (Kubicek 2002). Our interaction analyses, showing that the negative association of trade union membership with self-rated health occurs basically in the Northwestern and Siberian Districts, provide some support for this reading. The economies of these two regions, located in the northern parts of Russia, rely strongly on industries such as mining, metal processing and forest industry (Dudarev et al. 2004; Hill 2004), which are heavy in terms of work conditions. From this point of view, trade union membership could act as a proxy for a more hostile working environment and unfavourable working conditions. The trade unions also provide certain health and welfare benefits, such as covering medical costs, rest in sanatoriums or paid sick leave (Ashwin & Clarke 2003, 197), which might attract people with health problems to join or stay as trade union members. This topic also calls for more research.

Finally, Russia's recent healthcare reforms have aimed at optimising and modernising the system and enhancing the quality of healthcare. However, now Russia is in the midst of an economic crisis and the reforms have been implemented by cutting the number of hospitals and doctors. The closing of smaller hospitals and local clinics as a part of this modernisation has made healthcare inaccessible for many Russians, especially in rural areas. According to the Accounts Chamber of the Russian Federation, contrary to its aims, the reforms have instead increased mortality and morbidity, especially in the rural areas (Audits Chamber 2015; see also Grigoriev et al. 2014). As our results show, the lowest self-ratings of health are reported in the Far Eastern District, which is the largest but least populated of the districts. The Far Eastern District also spends most on public health per person (see Table 2), which might reflect bigger healthcare needs. On the other hand, the longer distances to the nearest healthcare facility can lead to less effective preventive healthcare and longer waiting times, which can contribute to lower self-rated health. The healthcare reforms, which aim to transfer the responsibilities for funding from federal to regional budgets,

may be especially dangerous for the already less affluent and less healthy rural regions. Thus, regional governance has a growing importance in preventing increases in health inequalities.

References

Ahnquist, Johanna, Wamala, Sarah, Lindström, Martin 2012. Social determinants of health–a question of social or economic capital? Interaction effects of socioeconomic factors on health outcomes. Social Science & Medicine 74 (6), 930–939.

Ashwin, Sarah 2004. Social partnership or a 'complete sellout'? Russian trade unions' responses to conflict. British Journal of Industrial Relations 42 (1), 23–46.

Ashwin, Sarah, Clarke, Simon 2003. Russian trade unions and industrial relations in transition. New York: Palgrave Macmillan.

Audits Chamber 2015. Schetnaia palata proverila optimizattsiiu v sfere zdravookhraneniia, kultury, obrazovaniia I sotsialn'nogo obsluzhivaniia. (Audit Chamber checked the optimization of the spheres of health, culture, education and social services). Audit Chamber, 13.4.2015 http://www.ach.gov.ru/press_center/news/21297

Bobak, Martin, Pikharta, Hynek, Hertzmanb, Clyde, Rose, Richard, Marmot, Michael 1998. Socioeconomic factors, perceived control and self-reported health in Russia. A cross-sectional survey, Social Science and Medicine, 47 (2), 269–279.

Bobak, Martin, Pikharta, Hynek, Rose, Richard, Hertzman, Clyde, Marmot, Michael 2000. Socioeconomic factors, material inequalities, and perceived control in self-rated health: cross-sectional data from seven post-communist countries, Social Science and Medicine, 51 (9), 1343–1350.

Burström, Bo, Fredlund, Peeter (2001) Self-rated health: Is it as good a predictor of subsequent mortality among adults in lower as well as in higher social classes? Journal of Epidemiology and Community Health. 55(11): 836-40.

Carlson, Per 1998. Self-perceived health in East and West Europe: another European health divide, Social science and Medicine, 46 (10), 1355–1366.

Carlson, Per 2001. Risk behaviours and self-rated health in Russia 1998. Journal of Epidemiology & Community Health, 55 (11), 806–817.

Carlson, Per 2004. The European health divide: A matter of financial or social capital? Social Science & Medicine, 59 (9), 1985–1992.

Carlson, Per 2005. Relatively poor, absolutely ill? A study of regional income inequality in Russia and its possible health consequences, Journal of Epidemiological Community Health 59 (5), 389–395.

Carlson, Per 2015. Trust and health in Eastern Europe: Conceptions of a new society. International Journal of Social Welfare, 25 (1), 69–77.

Carlson, Elwood, Hoffmann, Rasmus 2011: The state socialist mortality syndrome. Population research and policy review 30(3), 355-379.

Cockerham, William 2000. Health lifestyles in Russia. Social science & medicine 51 (9), 1313-1324.

Curtis, Sarah, Jones, Ian Rees 1998. Is there a place for geography in the analysis of health inequality? Sociology of health & illness 20 (5), 645–672.

ESS Data Archive 2014. ESS6 – 2012 Documentation Report. Edition 2.1. https://www.europeansocialsurvey.org/docs/round6/survey/ESS6_data_documentation_report_e02_1.pdf

Dudarev, Grigory, Sergey Boltramovich, Pavel Filippov, and Hannu Hernesniemi 2004. Advantage Northwest Russia-The New Growth Center of Europe. ETLA B.

Fedorov, Leonid 2002. Regional inequality and regional polarization in Russia, 1990–99. World Development 30 (3), 443-456.

Ferlander, Sara, Mäkinen, Ilkka Henrik 2009. Social capital, gender and self-rated health. Evidence from the Moscow Health Survey 2004. Social Science & Medicine 69 (9), 1323–1332.

Grigoriev, Pavel, Meslé, Shkolnikov, Vladimir, Andreev, Evgeny, Fihel, Agnieszka, Pechholdova, Marketa, Vallin, Jacques 2014. The recent mortality decline in Russia: beginning of the cardiovascular revolution? Population and Development Review 40(1), 107-129.

Heistaro Sami, Jousilahti Pekka, Lahelma Eero, Vartiainen Erkki, Puska Pekka 2001. Self-rated health and mortality. A long term prospective study in eastern Finland. Journal of Epidemiology and Community Health 55 (4), 227–232.

Hill, Fiona 2004. Siberia: Russia's economic heartland and daunting dilemma. Current History 103(675): 324-331.

Jylhä Marja 2009. What is self-rated health and why does it predict mortality? Towards a unified conceptual model. Social Science and Medicine 69 (3), 307–316.

Kawachi, Ichiro, Kennedy, Bruce, Glass, Roberta 1999. Social capital and self-rated health: a contextual analysis. American journal of public health 89 (8), 1187–1193.

Kennedy, Bruce, Ichiro Kawachi, Elizabeth Brainerd 1998. The role of social capital in the Russian mortality crisis, World development, 26 (11), 2029–2043.

Kubicek, Paul 2002. Civil society, trade unions and post-soviet democratisation: Evidence from Russia and Ukraine. Europe-Asia Studies 54 (4), 603–624.

Lane David 2013. Dynamics of Regional Inequality in the Russian Federation: Circular and Cumulative Causality. Russian Analytical Digest, 139, ISN ETH Zurich. http://www.isn.ethz.ch/Digital-Library/Publications/Detail/?ots591=0c54e3b3-1e9c-be1e-2c24-a6a8c7060233&lng=en&id=173822

Ledeneva, Alena 2009. From Russia with 'Blat': Can Informal Networks Help Modernize Russia? Social Research 76 (1), 257–288.

Lundberg Olle, Manderbacka Kristiina 1996. Assessing reliability of a measure of self-rated health. Scandinavian Journal of Public Health 24(3), 218-224.

Macintyre, Sally, MacIver, Sheila, Sooman, Anne 1993. Area, class and health: should we be focusing on places or people? Journal of social policy 22 (2), 213–234.

Men, Tamara, Brennan, Paul, Boffetta, Paolo, Zaridze, David, 2003. Russian mortality trends for 1991-2001: analysis by cause and region. Bmj, 327(7421),964.

Moustgaard Heta 2015. Social differentials in the outcomes of depression: a longitudinal register study. Publications of the Department of Social Research 2015/8, University of Helsinki.

Nicholson, Amanda, Bobak, Martin, Murphy, Michael, Rose, Richard, Marmot, Michael 2005. Socio-economic influences on self-rated health in Russian men and women—a life course approach, Social Science and Medicine, 61 (11), 2345–2354.

OECD 2015. Country Statistical Profile: Russian Federation. http://www.oecd-ilibrary.org/economics/country-statistical-profile-russian-federation_20752288-table-rus

Perlman, Francesca, Bobak, Martin 2008. Determinants of self-rated health and mortality in Russia – are they the same? International journal of Equity in Health, 7 (19), 1–8.

Petrov, Nikolai 2002. Seven Faces of Putin's Russia: Federal Districts as the New Level of State—territorial Composition. Security Dialogue 33 (1), 73–91.

Remington, Thomas 2011a. The politics of inequality in Russia. Cambridge, UK: Cambridge University Press.

Remington, Thomas 2011b. Russian Regional Inequality in Comparative Perspective. Paper prepared for Benjamin F Shambaugh Conference 'Lessons from subnational comparative politics: theory and method in the third decade of studying Russia's regions'. University of Iowa, October 6-9, 2011.

Rojas, Yerko, Carlson, Per 2006. The stratification of social capital and its consequences for self-rated health in Taganrog, Russia, Social Science and Medicine 62 (11), 2732-2741.

Rose, Richard 2000. How much does social capital add to individual health? A survey study of Russians. Social Science & Medicine, 51 (9), 1421–1435

Rose, Richard 2009. Understanding Post-Communist Transformation. New York: Routledge

Rosstat 2014: Regiony Rossii. Sotsial'no-ekonomicheskie pokazateli (Russian Regions. Socio-economic indicators). http://www.gks.ru/bgd/regl/b14_14p/Main.htm

Shkolnikov, Vladimir, Andreev, Evgeny, McKee, Martin, Leon, David 2013: Components and possible determinants of the decrease in Russian mortality in 2004-2010. Demographic research 28(32): 917-950.

Siller Arlene, Tompkins Linda 2006. The big four: Analyzing complex sample survey data using SAS, SPSS, STAT, and SUDAAN. SUGI 31 Proceedings, Paper 172-31. San Francisco, 2006. http://www2.sas.com/proceedings/sugi31/172-31.pdf

Vågerö , Denny, Kislitsyna Olga 2005. Self-reported heart symptoms are strongly linked to past and present poverty in Russia: evidence from the 1998 Taganrog interview survey, The European Journal of Public health, 15 (4): 418–423.

Vuorisalmi, Merja, Pietilä, Ilkka, Pohjolainen, Pertti, Jylhä, Marja 2008. Comparison of self-rated health in older people of St. Petersburg, Russia, and Tampere, Finland: how sensitive is SRH to cross-cultural factors? European Journal of Ageing, 5 (4), 327–334.

Walberg, Peder, McKee, Martin, Shkolnikov, Vladimir, Chenet, Laurent, Leon, David 1998. Economic change, crime, and mortality crisis in Russia. BMJ, 317, 312-318.

Appendix 1. Descriptive statistics of the respondents (unweighted).

	Mean / %	SD	n / base	min	max
REGION					
Central (ref.)	28.1	.	2484	.	.
Northwestern	9.4	.	2484	.	.
Volga	21.1	.	2484	.	.
South	10.2	.	2484	.	.
North Caucasian	5.9	.	2484	.	.
Urals	7.1	.	2484	.	.
Siberian	14.0	.	2484	.	.
Far Eastern	4.1	.	2484	.	.
DEMOGRAPHIC					
Age	46.0	18.1	2481	15	90
Woman	61.7	.	2484	.	.
Divorced	16.9	.	2444	.	.
Big city (ref.)	44.1	.	2481	.	.
Town	34.9	.	2481	.	.
Countryside	21.0	.	2481	.	.
SES					
Unemployed	3.7	.	2483	.	.
Basic education (ref.)	12.6	.	2484	.	.
Secondary education	55.6	.	2484	.	.
Tertiary education	31.9	.	2484	.	.
Place in society	4.5	1.7	2404	0	10 ("Top")
Economic situation	2.4	0.8	2420	1	4 ("Living comfortably")
SOCIAL					
Interpersonal trust	0.0	0.8	2484	-2.14	2.61
Institutional trust	0.0	1.0	2484	-1.69	3.23
Loneliness	15.1	.	2113	.	.
Exchange of help	4.5	1.2	2474	0 ("Not at all")	6
Trade union member	50.7	.	2444	.	.
Vote	65.0	.	2464	.	.
Voluntary organisation	29.6	.	2381	.	.

Appendix 2: Technical details on the social capital indicators.

Interpersonal participation.

We calculated a variable describing the level of involvement in the *exchange of help* among the people the respondent is close to (a mean of two seven-point scales).

Three variables were used for the construction of the indicator for *loneliness*. How often one meets socially with friends, relatives and colleagues was dichotomised by classifying those who respond 'never' or 'less than once a month' together. How often one takes part in social activities compared to others of same age was dichotomised by combining 'much less than most' and 'less than most'. Those who have nobody to discuss intimate and personal matters with were indicated by a separate variable. Next, we calculated a sum of the three indicators, imputed the median of the sum for the missing cases (n=371), and dichotomised the result, such that those who had a sum of 2 or 3 were categorised as lonely.

Institutional participation.

Three variables were constructed for measuring institutional participation: voting in the last national elections, trade union membership and participating in a voluntary organisation (never/at least sometimes).

Interpersonal and institutional trust.

Factor scores with clear interpretations, indicating respectively interpersonal and institutional trust, were extracted from a set of eight variables (scales 0–10) by a Varimax-rotated solution. Three variables tapped interpersonal trust: 'Most people can be trusted or you can't be too careful', 'Most people try to take advantage of you, or try to be fair' and 'Most of the time people are helpful or mostly looking out for themselves'; Cronbach's alpha for the scale=0.72. Five variables indicated institutional trust: trust in parliament, in the legal system, in the police, in politicians and in political parties; alpha=0.92.

Table 1. Social capital indicators (ESS variable names in parentheses)

Indicator	Type	Items
Interpersonal participation		
Exchange of help	Mean	Providing help (prhlppl) Receiving help (rehlppl)
Loneliness	Dichotomy	Socially meeting friends, relatives and colleagues (sclmeet) Taking part in social activities (sclact) People to discuss intimate matters with (inprdsc)
Institutional participation		
Voting	Dummy	Voted in the last national elections
Trade union membership	Dummy	Member of a trade union (mbtru)
Participating in a voluntary organisation	Dummy	Participated in voluntary or charitable organisations (wkvlorg)
Interpersonal trust	Factor score	Most people can be trusted or you can't be too careful (ppltrst) Most people try to take advantage of you or try to be fair (pplfair) Most of the time people are helpful (pplhlp)
Institutional trust	Factor score	Trust in the country's parliament (trstprl) Trust in the legal system (trstlgl) Trust in the police (trstplc) Trust in politicians (trstplt) Trust in political parties (trstprt)

Table 2. Key indicators of the Federal Districts (source: Rosstat 2014, data year 2012)

District	Central	Northwestern	Southern	North Caucasian	Volga	Urals	Siberian	Far Eastern	Russia
Population (millions)	38.7	13.7	13.9	9.5	29.8	12.2	19.3	6.3	143.3
Urban population (%)	81.7	83.8	62.6	49.2	71.0	80.3	72.4	75.1	74.0
GRP per capita (roubles)	451536	384166	227618	127640	265544	582667	267126	431453	348599
Average consumer spending per capita (roubles per month)	22052	17436	15969	12673	14744	19055	13473	17258	19075
Mortality (deaths per 1000)	13.9	13.8	13.4	8.3	14.0	12.6	13.7	13.1	13.3
Number of reported crimes per 100000 people	1420	1502	1339	774	1567	1874	2116	2046	1608
Budget spending in total (roubles per capita, RPC)	71216	65157	42175	35616	42791	76833	49858	93943	58222
-Education (RPC)	15684	15362	10202	10047	11220	19542	14328	22494	14285
-Public health (RPC)	12277	9120	7129	5326	7196	11994	8532	13192	9479
-Social politics (RPC)	11488	9029	7096	5718	6779	9890	7935	12153	8889

Table 3. Design-based logistic regression models of good self-rated health in Russia (Odds Ratios (OR); n=2414, data: ESS 2012).

	I: Region		II: Region & age		III: Region, age & demographic		IV: Region, age & SES		V: Region, age & social		VI: Full	
REGION	**OR**	***Sig.***	**OR**	***Sig.***	**OR**	***Sig.***	**OR**	***Sig.***	**OR**	***Sig.***	**OR**	***Sig.***
Central (ref.)	.	.	.	.	.	.	.	.	.	.	.	.
Northwestern	1.13	.	1.55	*	1.62	*	1.81	**	1.64	**	1.91	***
Volga	0.70	**	0.77	.	0.76	+	0.90	.	0.78	.	0.86	.
South	1.39	*	1.81	**	1.87	**	2.04	***	1.72	**	1.94	**
North Caucasus	1.37	.	1.11	.	1.04	.	1.30	.	1.02	.	1.02	.
Urals	0.93	.	1.30	.	1.40	.	1.49	.	1.28	.	1.51	.
Siberia	0.90	.	1.26	.	1.24	.	1.37	+	1.24	.	1.27	.
Far East	0.41	**	0.37	**	0.40	**	0.43	**	0.38	**	0.45	*
DEMOGRAPHIC												
Age	.	.	0.94	***	0.94	***	0.94	***	0.94	***	0.94	***
Woman	.	.	.	.	0.64	***	.	.	.	.	0.61	***
Divorced	.	.	.	.	1.23	.	.	.	.	.	1.53	**
Big city (ref.)	.	.	.	.	.	.	.	.	.	.	.	.
Town	.	.	.	.	0.80	+	.	.	.	.	0.95	.
Countryside	.	.	.	.	1.23	.	.	.	.	.	1.47	*
SES												
Unemployed	.	.	.	.	.	.	1.10	.	.	.	1.04	.
Basic education (ref.)	.	.	.	.	.	.	.	.	.	.	.	.
Secondary education	.	.	.	.	.	.	0.90	.	.	.	0.95	.
Tertiary education	.	.	.	.	.	.	1.09	.	.	.	1.23	.
Place in society	.	.	.	.	.	.	1.17	***	.	.	1.15	***
Economic situation	.	.	.	.	.	.	1.42	***	.	.	1.39	***
SOCIAL												
Interpersonal trust	.	.	.	.	.	.	.	.	1.18	*	1.16	*
Institutional trust	.	.	.	.	.	.	.	.	1.12	+	1.07	.
Loneliness	.	.	.	.	.	.	.	.	0.80	.	0.80	.
Exchange of help	.	.	.	.	.	.	.	.	1.19	***	1.14	**
Trade union member	.	.	.	.	.	.	.	.	0.63	***	0.67	**

Vote	.		.		.		.		0.97	.	0.94	.
Voluntary organisation	.		.		.		.		1.38	**	1.35	*
McFadden's Pseudo R Squared	0.013		0.301		0.316		0.334		0.328		0.369	

Note: + p ≤ 0.1, * p ≤ 0.05, ** p ≤ 0.01, *** p ≤ 0.001

Table 4. Interaction results (B, sig.).

	Central (ref.)	**North-western**	**Volga**	**South**	**North Caucasus**	**Urals**	**Siberia**	**Far East**
Age	-0.052 (***)	-0.34 (*)	0.00	0.01	0.01	0.02	-0.05 (***)	0.01
Economic situation	0.433 (**)	-0.123	-0.257	-0.194	-0.629 (*)	0.371	-0.088	0.211
Loneliness	-0.235	0.092	0.131	-0.089	-1.629 (*)	-0.302	-0.52	0.909
Trade union member	-0.261	-0.982 (*)	0.111	0.183	0.397	0.393	-0.908 (*)	-0.004
Vote	0.233	-0.645	-0.584	-0.24	-0.18	0.493	-0.727 (*)	-0.147
Voluntary organisation	0.067	0.67	0.185	0.57	1.197 (*)	0.373	-0.108	-0.03

Notes:

1) * p ≤ 0.05, ** p ≤ 0.01, *** p ≤ 0.001
2) For the reference class (Central), the table shows the beta coefficients of each variable (null hypothesis: coefficient = 0). For the other regions, the results are interaction effects, with Central as the reference (null hypothesis: difference from Central = 0)